

ABSTRACT OF THE DISCLOSURE

Aspects of the invention relate to a turbine engine system and method for actively managing blade tip clearances during part load operation of the engine. Aspects of the invention relate to extracting a portion of the combustion gases from the combustor section of the engine and routing these heated gases to the blade rings or other stationary structure surrounding the turbine blades. Upon exposure to the combustion gases, which can be mixed with compressor exit air, the stationary structure will thermally expand, causing blade tip clearances to increase. Thus, concerns of blade tip rubbing are minimized. Once the engine achieves steady state operation, the flow of the combustion gases to the blade rings can be substantially restricted so that only compressor exit air is supplied to the stationary structure. Consequently, the stationary structure will contract and the blade tip clearances will decrease, thereby increasing the efficiency of the turbine.